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THE AMERICAN JOURNAL
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VOL. XXXIV. APRIL, 1917. No. 4

ORIGINAL ARTICLES.

OCULAR DISEASES OF DENTAL ORIGIN.*
(A Collective Abstract.)

By Wm. F. Hardy, M.D.,
ST. LOUIS, MO.

There has arisen in the last few years considerable literature bearing on oral sepsis and the resultant effects on the human economy by reason of its presence. Oral hygiene is now the order of the day. How our ancestors got along is unknown. The condition of the teeth of savages is usually referred to as excellent; therefore if this be true, something in our modern way of living, and especially of eating, must have a bearing on the question. What the dentists say regarding sweets, candies, etc., I know not, but there is no disputing the fact that the per capita consumption of sugar by the American people has increased tremendously in the last four decades.

One of the greatest faults we must get away from is in being satisfied with the discovery of one ætiological factor. We must look for and first treat the obvious, but should keep in mind other possibilities. For instance, an individual may give a four plus Wassermann, and yet his iridocyclitis may actually be due to an apical abscess or other cause. This point has been emphasized by De Schweinitz and others. While not a dentist, and therefore unable to justly pass on any dental procedure, it has always seemed to me that the old style gold cap crowns were unsurgical and unscientific. Retraction of the gums leaves an area of exposed tooth between crown and gum subject to attack by the mouth secretions and bacteria. It seems no won-

*Read before the St. Louis Dental Society, March 6, 1917.

der that gum abscesses and deeper infections should result in such cases to say nothing of the impossibility of keeping the mouth clean. If wrong I am willing to be corrected. It may be an erroneous impression, but I have been imbued with the idea of ipsolaterality of the lesions where an ocular complaint and dental abscess were co-existent. It might be argued that the infection or toxic agent being in the general circulation, homolaterality would have no place. But, if the infection is in the general circulation, why are not both eyes more frequently simultaneously affected? May it not be possible that a route other than the blood exists? Numerous studies have been made of the bacterial flora of the mouth, and of the pus of root abscesses. The frequency with which streptococcus viridans is found is remarkable. The lethal properties of this organism are well known. They probably exist in most cases in an attenuated form, and that only their toxins pass to the circulation.

Studies in oral sepsis have done much to clear up some very obscure medical problems—myositis, arthritis, i.e., rheumatism and arthritis deformans, are cases in point. Various strains of streptococci have been traced from oral foci to the joints and muscles. It is not too hypothetical to assume that the eye can in like manner be involved. The investigations of Billings, Rosenow and others have pointed the way. While my remarks include ocular troubles, the result of oral sepsis of all kinds, yet especial attention is given to apical abscesses of the teeth. Ocular troubles due to teeth may be classified under two heads, as follows: 1st, Reflex. 2nd, Inflammatory. The inflammatory troubles may result from (a) general oral sepsis (decaying teeth, lack of cleanliness, etc.), (b) pyorrhœa, (c) apical or root abscesses. It appears that the uveal tract is susceptible to the infections originating in the mouth, which goes far to clear up the ætiology of many heretofore puzzling cases. De Schweinitz emphasizes the fact that the infection in uveitis may come from a small tooth root abscess, the presence of which is not suspected and often undetected until X-rays are employed, and even these are sometimes difficult of interpretation. Cases illustrating this are recorded by F. C. Todd and De Schweinitz.

A. D. Black (*Op. Rec.*, Vol. 24, p. 610) has given us a very valuable contribution on ocular disease, resulting from dental lesions. Black, who is a dentist in addition to being a physician, has looked at the problem from a dental point of view. Ocular diseases of dental origin should, he states, be divided into two

groups: (1) Reflex neuroses presenting as sensory vaso-motor or muscular disorders. (2) Inflammations of the various tissues of the eye due to infections. The first group does not concern us in this evening's discussion. The second group does however. According to Black, when the eye symptoms are of a toxic or infective nature, the condition of the peridental membrane should be investigated. There are two pathological processes which involve the peridental membrane. (1) Alveolar abscess, which always occurs subsequent to the death of the pulp. (2) Chronic suppurative pericementitis, so called pyorrhœa, which always begins at the gingival margins and gradually involves and cuts away the peridental membrane from the root, forming a pus pocket. There are two routes of transmission from the mouth to eye, endogenous, the common, and exogenous, the rare. Endogenous transmission may be by blood stream, lymphatics or direct continuity of tissue. Black reviewed the articles in one series of dental journals from 1839 to 1915 and appended to his article the bibliography and also a summary of the ocular diseases caused by mouth lesions, arranged as a crossed reference. Because of its value I have given it in full.

Ivy (*Wisconsin Med. Jour.*, May, 1916) contributed an interesting article, "Chronic Mouth Infection in Relation to Systemic Disease". He deals with the subject in a general way, no particular reference being made to ocular diseases. The summary of the evidence in support of the view that foci of infection in the mouth at times play an important ætiological role in certain systemic diseases is worth repeating. (1) Streptococci can nearly always be demonstrated if proper technique be used in closed areas of chronic periapical infection. (2) These areas as demonstrated by histological sections have a direct connection with the blood and lymph streams through which the infection may reach other parts of the body. (3) Rosenow has been able to produce in animals with streptococci isolated from mouth foci, the same systemic lesion as was present in the patient. (4) Marked improvement or even disappearance of the particular systematic condition affecting the patient frequently follows removal of sources of chronic streptococcal infection in the mouth. Among the diseases mentioned are secondary anæmia, acute and chronic arthritis, myositis, neuritis, and various eye lesions. An interesting feature of Ivy's routine examination is the determination of response of each tooth to the Faradic current.

The researches of Hartzell show that over ninety per cent. of all apical infections yield cultures of the streptococcus viridans. Ivy found streptococcus viridans in a large percentage of his cases. Haskins speaks of the manner in which the body suffers from oral septic foci; 1. From the constant absorption of the toxins that are produced during the growth of many bacteria; 2. From the actual invasion of the blood stream by the bacteria themselves. The first is said by Haskins to be by far the most common condition. To quote him: "Filling the septic abscess at the gingival border are the septic teeth whose roots project up into the pockets and act as hydraulic pumps with each act of mastication, forcing the soluble toxins into the circulation even though no bacteria escape." Haskins reported seven cases of ocular trouble of dental origin.

Impacted upper bicuspid and third molars are said to be prolific sources of trouble.

Three cases of eye disease of dental origin were recorded by Foucher (*L' Union Médicale du Canada*, 1895).

Ulrich showed that in over 68 per cent. of all artificially devitalized teeth apical abscesses were found.

Haskins (*Dental Cosmos*, October, 1916) has shown by X-ray demonstrations how impossible it is to successfully fill all root canals. For this reason, the removal of any doubtful tooth is urged.

De Schweinitz (*Ophthalmic Record*, 1915) points out that the organisms in a septic mouth are perfectly capable of producing a non-septic uveitis although the primary lesion is suppurative.

Ibershoff (*Journ. Ophth. and Oto-L.*, May, 1915) writes concerning carious teeth as a factor in ocular disease. Reference especially is made to vitreus opacities and three case reports given. In the cases he reports the mouths were in a foul condition, and demanded treatment for hygienic if for no other reasons. Where the mouth is a hot bed or a morass of infection the way is clear, but great difficulty arises in patients whose mouths are apparently in good condition. Emphasis is laid on apparently normal but in reality pathological teeth. Pyorrhœa is frequently mentioned as a factor in producing eye diseases; such reports have been made by Tibbles (*Brit. Med. Jour.*, January, 1914), Agnew (*Iowa State Med. Journ.*, 1915), W. Lang, Goulden, and others. Tibbles reported two cases, one of choroiditis, and another of iridocyclitis, the result of pyorrhœa.

Goulden (*R. L. O. H. Rep.*, Vol. XIX, pt. 3) collected some

information, gleaned from a study of 6,385 patients, concerning the rôle of diseased mucous membranes in causing uveal troubles. Of 142 cases of iridocyclitis, 64 were caused by septic teeth. Of 9 cases of disseminated choroiditis septic teeth caused one. The same cause produced two cases in four, of single patch choroiditis with keratitis punctata. Among his conclusions he arrived at the following: (1) that it is most likely that many cases of uveitis other than those due to syphilis and tuberculosis, are due to infection from a diseased mucous membrane. (2) That the most common cause of uveitis is oral sepsis.

Beaumont (*Brit. Med. Journ.*, September 26, 1914), discussing the evolution of toxæmic iritis, succinctly stated that the hæmatogenous theory of infection has led to the ætiological dethronement of iritis from the position of an independent disease to the secondary one of a complication. He further states that great attention is now paid to possible areas of infection be they in the nose sinuses, alveolar pockets, gastro-intestinal tract or prostate. Septic absorption from these areas may be the ætiological factor in a given case of iritis. The association of dental disease with iritis is perhaps more generally observed than are other sources of sepsis. Lang's statistics are quoted as showing that about 64 per cent. of cases of iritis attributed to sepsis are caused by pyorrhœa; this is due no doubt to the great prevalence of pyorrhœa. One should not be prejudiced, however, by the presence of a pyorrhœa and lose sight of a possible gonorrhœal, luetic or other infection. Attention to dental sepsis is imperative and Beaumont naïvely says that it is better to lose thirty-two teeth than one eye. With this statement I do not expect you to agree.

Mac Whinnie (*N. Y. Med. Journ.*, October 18, 1913) believes that in quite a few cases the ocular disturbance is due to diseased teeth which may show no evidence of decay, the trouble only being found when the X-ray is employed or exploration is done. Spasm of accommodation, hæmorrhages of the eye and temporary blindness are mentioned as results of tooth root trouble. Two cases are reported, one of spasm of accommodation, totally unrelieved by glasses but given relief in 24 hours following the evacuation of pus at the root of a cuspid. The second case was one of neuralgic pain in the right side of the face and with vision O. D. reduced to 6/30. Extraction of an upper molar evacuated pus, but the pain continued and relief was not afforded until 5 days later when the lower molar was extracted. Within an hour

all pain subsided and the vision quickly rose in the eye to 6/10.

Voelkers (*Dental Cosmos,* November, 1916) reports a case of iritis cured by attention to the teeth. The usual blood, tonsil, gastrointestinal and rhinological examinations had been made with no results. Recurring attacks of iritis covering a period of three years had occurred. The mouth was in a bad condition; Voelkers made radiographic pictures, cleaned up the mouth and extracted three teeth with a rapid subsidence of the iritis. An interesting point was that when a sinus of the left lateral incisor was treated, with a treatment sealed in with gutta percha, and left for a few days, the eye symptoms would gradually return; with the removal of the treatment there was always a flow of serum, sometimes containing blood. After extraction of this tooth all the iritic symptoms disappeared.

Hiram Woods (*Ophthalmic Record,* November, 1915) reported recurring attacks of uveitis in a lawyer 48 years old. These attacks covered a number of years and were apparently traced after two years to alveolar absorption. Woods is suspicious of all conjunctival redness unaccompanied by secretion and thinks it is a forerunner of deeper and more serious trouble. In the case described there was conjunctival injection followed by vitreous opacities, signs of a mild iritis and descemetitis. A "dead tooth," crowned, was finally removed, with a sudden exacerbation of all symptoms, sight dropped markedly; a later return to nearly normal vision occurred. This is of course but an isolated case, but it seems only fair to draw the conclusions which were drawn by the author. Again an indictment is drawn against the crowned tooth.

Dr. Lucie Oesterreicher (Abstr. in *Dental Cosmos,* 1915, p. 1312), in a report of the eye clinic in Prague, made the statement that almost all patients suffering with eczematous keratoconjunctivitis also show considerable dental caries. An absence of potassium sulfocyanate is shown in the saliva. Medication with this substance abbreviated the course of the ocular trouble. It is furthermore innocuous.

Davis (*Dental Cosmos,* Vol. 57, p. 769) discusses in a general way the interrelation of the teeth and the eye. He has observed in his own work numerous instances of faulty accommodation, either insufficiency or spasm, which were of dental origin.

Another article touching on the subject is by Daly (*Dental Cosmos,* 1915, p. 47).

In conclusion it appears that not only are the teeth capable of

causing ocular trouble but that they frequently do so. The mischief may be expressed as a reflex trouble evidencing itself as a pain or discomfort about the eyes, as a phoria, i.e., a lack of ocular muscle balance, or as an anomaly of accommodation either fatigue or spasm. It may be expressed as an inflammatory condition affecting particularly the uveal tract. Pyorrhæa, a frequent cause, is usually easily diagnosticated by a competent dentist; but apical abscesses hidden and unannounced in a clean mouth and with teeth to outward appearances normal, provide the greatest difficulties to be surmounted in arriving at the correct diagnosis. Patients are loath to sacrifice apparently normal teeth and the cost attendant on a complete radiagraphic examination is in many instances prohibitory.

The argument is raised that the connection between tooth and eye affections is too hypothetical and problematical, and that they are not related in cause and effect, but are coincidental. This view is based on the great prevalence of tooth affections and the relative infrequency of an associated eye disease. But the same is true of syphilis, gonorrhœa, and tuberculosis. How common are these and how relatively infrequent are ocular diseases the result of them. Yet no one disputes a syphilitic, gonorrhœal or tuberculous iritis or keratitis. It is incumbent upon ophthalmologists to consider the teeth in our list of possible ætiological factors, but to refrain from making of this possibility a hobby to be ridden to death.

Finally a plea should be made for closer co-operation between dentist and ophthalmologist, dentistry and medicine in general. I believe the progressive and alert dentist to be as much so as his brother physician, and relatively as numerous. On various occasions I have risen to the defense of dentists and have ever found them ready to adopt modern methods, and view points, and new procedures. All branches of medicine demand greater and closer team work now than at any previous time. Focal infections, and under this head come mouth infections, are being carefully studied at present. The one danger to be guarded against is the overdoing of it. However, in an obscure ætiology where other factors can be and have been eliminated we are justified in looking to the teeth as a possible cause and enlisting the help of the dentist.

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Accommodation, diminution or loss of, 21, 23, 24, 25, 38.
Amaurosis, 1, 3, 4, 5, 6, 7, 8, 9, 10, 14, 16, 18, 20, 21, 23, 25, 27, 35, 36, 37, 38.
Amblyopia, 21, 23, 24, 25, 38.
Blepharospasm, 21, 37, 38.
Cataract, 24, 28.
Chronic ophthalmia, 13, 25.
Conjunctivitis, 21, 24, 25, 28, 38, 40.
Corneal inflammations, 21, 38.
Exophthalmos, 21, 25, 38.
Extra-ocular muscles, spasms or paralysis of, 23, 28, 38.
Fatigue, 33.
Glaucoma, 21, 25, 38.
Hypermetropia, 28.
Iridocyclitis, 28, 25, 38.
Iritis, 25, 34, 38.
Kerato-scleritis, 24, 25.
Lagophthalmus, 21, 22, 25.
Mydriasis, 21, 24, 28.
Miosis, 38.
Neuralgia, 2, 29, 33, 35, 36, 37, 38.
Optic neuritis, 24, 25.
Orbital abscess, 23, 38.
Phlyctænular ophthalmia, 21, 25, 28.
Ptosis, 19, 25.
Sclerotitis, 22, 23, 25.
Strabismus, 21, 38.
Uveitis, 39.

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(2) Painful Affection of the Eye Cured by the Extraction of a Tooth. Dental News Letter, 1847-48, p. 46.

(3) Amaurosis from Dental Irritation. Watson. Dental News Letter, 1851-52, p. 296.

(4) Amaurosis from Decayed Teeth. Excerpt. Tabez Hogg in London Lancet, Dental News Letter, 1857-58, p. 160.

(5) Two Cases of Amaurosis Depending on Dental Irritation. Case of Ptosis and Diverging Strabismus from Decayed Teeth.

Henry Hancock on London Lancet. Dental Cosmos, 1859-60, p. 50.
(6) Amaurosis Consequent on Acute Abscess of Antrum Produced by a Carious Tooth. S. J. A. Salter in London Lancet. Dental Cosmos, 1862-63, p. 45.
(7) Kempton, Dental Cosmos, 1862-63, p. 548.
(8) De Witt, Dental Cosmos, 1868, p. 272.
(9) Alexander, Dental Cosmos, 1869, p. 161.
(10) Delestre, Dental Cosmos, 1869, p. 329.
(11) Wright, Dental Cosmos, 1870, p. 496.
(12) Wright, Dental Cosmos, 1870, p. 103.
(13) Blanc, Dental Cosmos, 1871, p. 634.
(14) Frühauf, Dental Cosmos, 1873, p. 662.
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(16) Lardier, Dental Cosmos, 1875, p. 389.
(17) Davis, Dental Cosmos, 1876, p. 110.
(18) Sirletti, Dental Cosmos, 1878, p. 685.
(19) St. Bartholomew's Hospital Reports, Dental Cosmos, 1881, p. 497.
(20) Marshall, Dental Cosmos, 1883, p. 425.
(21) Power, Dental Cosmos, 1884, p. 308.
(22) Hutchinson, Dental Cosmos, 1886, p. 123.
(23) Stevens, Dental Cosmos, 1901, p. 108.
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(26) Peck, Dental Cosmos, 1905, p. 103.
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(28) Goulden, Dental Cosmos, 1911, p. 216.
(29) Merritt, Dental Cosmos, 1911, p. 1445.
(30) Wright, Dental Cosmos, 1912, p. 266.
(31) Seydel, Dental Cosmos, 1913, p. 106.
(32) Dimmer, Dental Cosmos, 1913, p. 959.
(33) MacWhinnie, New York Med. Jour., Oct. 18, 1913, p. 755.
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(37) Ibershoff, Jour. Ophth. and Oto-Laryng., May, 1915, p. 141, and July, 1915, p. 209.
(38) Wood's Amer. Encyc. of Ophthalmology, Vol. V. p. 3817.
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A NECROTIC TUMOR OF THE SCLEROTIC.

By Adolf Alt, M.D.,
St. Louis, Mo.

The specimen which I desire to describe in the following detail, I owe to the kindness of Dr. F. E. Woodruff, of St. Louis. It was accompanied by the following history:

"Dorothy C., aet. 22, consulted me on April 1, 1916, on account of a congestion of the conjunctival bloodvessels of the left eye which had been present for a few days before this consultation. On examination I found a slight cloudiness of the cornea, especially in the lower segment, with minute infiltrated areas. There was, also, a slight congestion of the ciliary bloodvessels. There was, also a diffuse cloudiness in the cornea so that it was impossible to examine the fundus.

"This cloudiness of the cornea increased and with it the congestion of the ciliary bloodvessels and the deeper scleral bloodvessels became involved. The tension was normal. Light perception and projection were good.

"There was, also, present on the temporal side of the eyeball in the equatorial region a tumor mass the size of a hazelnut, pinkish in color, semisolid, without fluctuation, to the surface of which the conjunctiva was adherent. It appeared to be lying on the sclera, but attached to it. The eyeball could be transilluminated.

"Neither a Wassermann nor a tuberculin test was permitted, nor was I allowed to remove a small particle of the tumor for microscopic examination. On the other hand, there was no luetic history nor a tuberculous one to be elucidated. The patient could not say, how long the tumor formation had been going on.

"The patient was given protoiodide of mercury and potassium iodide without any effect. Locally atropin and dionin were used. The tension was at no time above the normal.

"Consultation shed no light on the diagnosis.

"During July and August, while I was on my vacation, the lens became very cloudy and by September the cataract was fully developed. Meanwhile the cornea had cleared up. The tension now became lower than normal. The tumor mass became flattened and its color changed from the former pink to a yellow. The flattening of the tumor increased and the tension of the eyeball decreased until finally consent was obtained to remove the eyeball. This was done on January 24th, 1917."

The eyeball was in formal solution when I received it. It was smaller than normal and the sclerotic was folded in on the nasal side as much as it seemed to be protruding on the temporal one. This protrusion on the temporal side appeared as if a flat disc was lying on the sclerotic covering the insertion of the external rectus muscle. This disc had a diameter of about fifteen mm. and was firmly adherent to the sclerotic.

The anterior chamber was deep and the pupillary edge of the iris seemed attached to the cataractous lens in toto.

The eyeball was cut in two by a horizontal section passing through the center of the scleral tumor. It was now plainly to be seen that the eyeball was phthisical in consequence of a long

continued intraocular inflammation, an endophthalmitis, which was probably still active since apparently rather recent hæmorrhages filled spaces situated between the detached retina and the choroid and between detached choroid and sclerotic.

The cornea appeared thinner than normal, so did the anterior part of the sclera on the nasal side, while the middle portion of the sclera on the temporal side was about 4 mm. thick and with a length of 6 mm. The posterior part of the sclera around the optic nerve entrance showed the usual thickening found in phthisical eyeballs.

The iris was agglutinated to the cataractous lens, the ciliary body was detached from the sclerotic, but much more so on the

nasal side than on the tumefied temporal one. The choroid, also, was in part detached from the sclera.

On the further sectioning it became clear that what appeared as a tumor which in its centre could not be differentiated from the sclera, had, in reality, the shape of a mushroom and with its periphery overlapped the sclera, being here more loosely connected with this membrane

Although this further macroscopical examination showed that all the membranes of the eye had taken and were still taking part in a general inflammatory process, we will here take up the microscopical description of the most interesting part, the apparent tumor.

A section through the centre of this thickening is apt to give an understanding of the real condition. As stated before, the choroid is in some parts detached, yet its tissue, while very hyperæmic, œdematous and infiltrated with leucocytes, is quite well preserved. Underneath the swelling, the choroid for some distance cannot be recognized as such and is replaced by a thick layer of necrotic tissue containing remnants of pigment. The choroid adjoining this necrotic patch at its periphery is well preserved and besides a general infiltration contains foci of infiltration as of septic origin. I was, however, unable to stain any pathogenic organisms in these foci. The necrotic remnant of the choroid is, in the sections, about as large as the base of the tumor and while slightly detached from it in some, lies in others in close contact with it. No cellular elements take up any stain.

The tumor above this necrotic choroid consists really of two component parts; the innermost of these is swollen sclerotic, the outer one is the real tumor. Yet, in the centre the two appear as one. The scleral part is necrotic, contains no cells and its fibre bundles are changed in their course so that they run at right angles almost to their usual one, that is from within outwards, not meridionally. The tumor itself, apparently superimposed on this necrotic sclera, shows no tissue elements, takes on no stain except eosin or acid fuchsin in the Van Giesen stain. The former seems to be uniform, the latter shows some red lines pervading the necrosed tissue running more or less parallel with the surface of the eyeball. The necrotic part of the sclerotic is outlined by a line of infiltration (demarcation). There are point-like hæmorrhages of older data in the necrotic tissues. Part of the anterior aspect of the tumor is covered by hyperæmic conjunctiva. In the section of the lower part of the tumor periphery

the here much thinner tumor lies in its posterior third on the tendon of the external rectus muscle, which divides it from the underlying necrotic sclera.

As stated above, all the tissues of the interior of the eye show the evidences of a former very active, probably purulent inflammation with large hæmorrhages and there are still a considerable number of active inflammatory foci present in the remnants of the uveal tract. The optic nerve, too, is still very much infiltrated. Yet, these evidences of former and present inflammation are not of particular interest, except in as far as they may be connected with the necrotic tumor.

I must confess that after an intense study of all the sections it seems most likely to me that the tumor is the result of the endophthalmitis, although, I do not know of a similar condition except, perhaps, when a gumma of the choroid has broken through the sclerotic. Yet, in this case no clinical evidence has been found of lues, but no Wassermann or other test has been made.

Certainly there was aside from the general inflammation of the uveal tract a localized one in the temporal part of the choroid which led to a local necrosis of this membrane. Right over this situation the covering sclerotic is also necrotic and this in turn is covered by a necrotic overlapping tumor. There must be a connection between these changes, also. I have not been able to find any direct evidence of a larger perforation of the sclerotic; the fact that its fibre bundles are turned outwards almost at right angles to their normal course, points to a force which passed through them from the choroid outward. If this was a choroidal gumma then the episcleral necrotic tumor was probably an infectious granuloma now undergoing necrosis. This seems to me to be the most likely explanation.

SUSPECTED TEETH AND THE WASSERMANN REACTION IN THE MISSOURI SCHOOL FOR THE BLIND.

By J. W. Charles, M.D.,
ST. LOUIS, MO.

In the March number of the American Journal of Ophthalmology, under the title, "Dental Stigmata of Syphilis and Transillumination in the Demonstration of Hutchinson's Teeth," the writer called attention to the fact that among the 106 pupils in the Missouri School for the Blind, a certain number exhibited evidence of disturbed nutrition at the time of the laying down of the enamel which had led to uneven or wavy lines in the enamel of the central incisors which could frequently best be seen by means of transillumination—what might be termed "atypical Hutchinson's" teeth, while the real Hutchinson's teeth are due to a total want of the enamel tubercules, resulting in the notching as well as narrowing of the incisal edge.

After our dentist, Dr. Chase, had selected all of those pupils who exhibited any irregularities in the teeth whatever, Dr. Jeans, from the St. Louis Children's Hospital, kindly offered to take the blood for the Wassermanns, which were made in the laboratory of Washington University.

The following table shows the conditions of the teeth and the result of the blood-test. Partly because the school is under the public school system of the State, wo do not feel it advisable to make spinal puncture except in selected cases:

W. M., ophthalmia neonatorum. Lower parts central incisors are lined horizontally. Wassermann taken February 22, 1917, negative.

N. P., 17 years. Metastatic uveitis. "Atrophy" upper incisors, cuspids and bicuspids, also lower cuspids and bicuspids. (Showing some constitutional disorder between ages of 3 and 6 years.) Has had swollen knee, which "improved rapidly under bichlorid of Hg. gr. 1-32, sod. iodide gr. V. t.i.d." O.D. V= motion hand 1 foot; O.S., V=Do. Wassermann, taken December, 1916, negative, blood and spinal.

L. L., 11 years. Anterior capsular cataract, R. and L. Both corneæ hazy. Polycoria R. and L. "Atrophy" in all teeth, the 2nd bicuspids excepted. O.D. V=20/150; O.S. V=. Wassermann, March 8, 1917, negative.

H. G., 13 years. Trauma and sympathetic ophthalmia. Possible Hutchinson teeth (upper left central). O.D. V=enucleated; O.S. V=0. Phthisis bulbi. Wassermann, taken March 8, 1917, negative.

J. O., 11 years. Congenital cataract. Upper left central incisor shows slight Hutchinson. O.D. V=3/240; O.S. V=20/240. Wassermann, taken March 8, 1917, negative.

G. S., 17 years. Metastatic uveitis. Upper left central incisor shows erosion. O.D. V=0. phthisis bulbi; O.S. V=0, phthisis bulbi. Wassermann, taken March 8, 1917, negative.

A. A., 11 years. Ophthalmia neonatorum. Slight Hutchinson teeth. Rounding incisal edges of upper central incisors. O.D. V=L.P., phthisis bulbi; O.S. V=0, phthisis bulbi. Wassermann, taken March 8, 1917, negative.

R. D., 21 years. Optic atrophy. Congenital syphilis, for which is still under treatment from Washington University Dispensary. Slight Hutchinson tooth (right upper incisor "broken off"). O.D. V=L.P.; O.S. V=3/75. Wassermann, blood++++, spinal++.

M. O., 10 years. Retino-chorioiditis—fixed pupils R. and L. V=20/96 R. or L. Right central incisor is typical Hutchinson's, the left is an "atypical" Hutchinson's; the upper first molars and lower left cuspids are "atrophic." Wassermann=blood positive, spinal negative.

A. B., 15 years. Parenchymatous keratitis. Intensive antisyphilitic treatment at Children's Hospital from November 27. Hutchinson teeth (upper central incisors), and the upper bicuspids are affected. O.D. V=3/96; O.S. V=3/30. Wassermann, taken November 13th, 1916, blood positive, spinal fluid negative.

N. M., 21 years. Ophthalmia neonatorum. Left central incisor shows slight notching. O.D. V=3/96; O.S. V=motion hand 2 feet. Leukoma adherens. Wassermann, taken March 8, 1917, ++++blood.

L. W, shows the "atypical" Hutchinson incisors. Wassermann, taken February 22, 1917, negative.

When one considers the statistics of syphilographers, we find the proportion of positives sufficiently high to make these teeth significant as indices although not pathognomonic. 75 per cent. of these pupils are from rural communities.

Reuben Petersen found 6 per cent. positives in 2,000 patients in the hospital at Ann Arbor. Landovsky in Laennec's clinic (*Bul. acad. Med.*, Paris, No. 16) found 15 to 18 per cent. positive in women and 21 per cent. to 28 per cent. in men.

CONSIDERING "PROVOKED" CONJUNCTIVITIS.*

By Dr. van Schevensteen.

Eye affections belong to those which can easiest be provoked and kept up.

Conjunctivitis is the usual clinical form of these special affections.

We have observed two types very sharply separated by their anatomical characters:

1. The forms in which powdered ipecac was the provoking agent.

2. The forms in which the provoking agent could not be identified with certainty. Concerning these we are satisfied by some hypotheses which we shall mention later.

From the studies we have made we want to describe first the lesions produced by the powder of ipecac.

The powder of the root of ipecac contains as chemical elements some alkaloids, among which there is emetin. Its physiological effects which interest us particularly are an irritation of the naked skin and the mucous membranes; this action is particularly due to emetin which exerts a local irritating action on the mucous membranes and the integuments, especially when the latter present a certain acidity, and there it causes pseudo-variola pustules.

1. When powdered ipecac is put into the conjunctival sac, there results within a few hours a considerable injection of the mucous membrane and a great swelling of the subconjunctival tissue (chemosis); a minimal secretion of mucus; these very violent, irritative and painful phænomena are usually accompanied by a swelling of the lids so considerable that the eyes cannot be opened. A single application suffices to produce these phænomena. These symptoms are particularly acute in the lower fornix, which place is the easiest reached, the contact of the chemical agent is there the most direct and its action the most marked. We shall therefore speak particularly of this.

Yet, we have had occasion to observe a case of the highest irritation in the upper fornix; the patient had simply turned the upper lid to make an application.

At the time of examining the fresh lesions the conjunctiva of the lower fornix is swollen, raised in great folds, although the

*La Clinique Ophtalmologique, October, 1916.

surface is smooth, but at times it is covered by a pseudomembrane; the color varies from scarlet red to a livid or purplish red.

After a few hours, especially if no further application has been made, the violent reaction recedes. The condition of the inferior fornix presents such a peculiar aspect that it is, so to speak, characteristic of this affection: the subconjunctival tissue is swelled, œdematous, the folds of the conjunctiva are still deep, the vascular designs are covered by exudates; the color of the mucous membrane is especially noticeable, it assumes a yellowish salmon color which persists for a long time.

The farther from the beginning of the "accident" the more the conjunctiva is smoothed out; its folds disappear, however, faster than the characteristic salmon color.

This whole evolution takes about three weeks. After that the eye has returned to its normal state, if the application has not been repeated.

2. When the application is made repeatedly the violent reactions of the first application do not repeat themselves, a certain tolerance seems to have been established; but although the painful symptoms disappear the anatomical changes become more and more characteristic. We note first a very considerable thickening of the lower conjunctival fornix, the surface always remaining smooth, with the altogether particular salmon color, then a more and more marked disappearance of the vascular designs.

At an even more marked stage the thickened lower eyelids are slightly ectropionized, and on account of the turning out of the puncta lacrimalia, a slight tear stasis is produced leading to a form which comes very near to a lacrimal conjunctivitis.

In the most obstinate cases the conjunctivitis of the upper fornix presents certain changes. The vascular designs of the tarsal conjunctiva disappear, blotted out by its thickening, and often at the upper edge of the tarsus fine small points are formed reminding one very vaguely of primary trachomatous follicles which sometimes might be taken for those. In a very extreme case we have seen the tarsal conjunctiva assume a uniform straw-yellow color.

The bulbar conjunctiva reacts in a certain way, also; it becomes pale, anæmic, a little milky as we see it in certain cases of xerosis of the conjunctiva or in vernal conjunctivitis.

Sometimes a slight encroachment of the conjunctiva of the

corneoscleral limbus on to the cornea is observed, especially on the inferior margin of the cornea; the bulbar conjunctiva appears much looser, less adherent to the subconjunctival tissue; it can be folded easily. We may, also, mention that the bulbar conjunctiva is easily injected; the usual manipulations, a somewhat prolonged inspection quickly produces a superficial perikeratic injection of the conjunctiva. It takes very long for this symptom to disappear. The instillation of a medicamentous and slightly caustic collyrium of zinc sulfate or copper in a weak dose instantly provokes a strong reaction accompanied by a flow of tears and a rapid curdling of these solutions, much more rapid in its appearance than in cases where no suspicion of this conjunctivitis exists.

In the cases in which the applications have been made very frequently the lesions persist a very long time after the applications have ceased.

The conjunctiva of the lower fornix remains thickened for a long time, the vascular network is very slow in reappearing, it always appears covered over by the subconjunctival cellular proliferation, the salmon color, sometimes somewhat livid, shows white slightly cicatricial striations, traces of cauterizations produced by the powder.

The secretion is very scant as well in the beginning of the affection, as even in the most chronic cases. In certain forms of superadded infection, that is in which other chemical agents are employed after the primary application of ipecac, the secretion may become profuse to a certain degree. We have had occasion to observe an abundant and persistent secretion in a case in which the primary application of ipecac was followed by the touching with garlic juice. In this particular case, at first the discovery of garlic which the patient did not use in his food, a particularly severe reaction after instillations of nitrate of silver into the eye of the patient, and finally experiments *in vitro* in order to observe the precipitation of silver nitrate in the presence of garlic (allyl sulphur), had given us the key to the mystery.

In declining cases (without subsequent instillation of ipecac) the use of a collodion bandage untouched for three or four days has given us a very small amount of dry secretion, barely glueing the lids together and disappearing altogether when this bandage was repeated.

These ocular lesions may be complicated by lesions in the neighborhood. Sometimes, and especially in the beginning, the

skin simply macerated, sometimes "erisypelatoid," like a beginning eczema; in other cases impetiginous pustules appear on the eyelids and all around the eye.

When a cure is effected the skin in the region around the eye retains for a long time a certain thickening and the impetiginous pustules disappear spontaneously, leaving slightly pigmented scars of a very light brown, a tint actually reminding one of the color of ipecac itself.

Diagnosis.—In the acute forms one must remember the clinical picture above described. Conjunctivitis, often unilateral, sudden beginning, with very violent irritative phænomena; considerable swelling of the elevated and gorged conjunctiva of the lower fornix; scarcely any secretion, sometimes like a pseudomembrane; impossibility to open the eyes spontaneously; surroundings of the eye sometimes "erisypelatoid."

In the chronic forms we must remember the following symptoms: Frequently one-sidedness, lesion located in the lower fornix, color of the smooth conjunctiva particularly like salmon, with deep folds, bare of vascular design, sometimes lesion in the upper fornix, scant secretion; the particular condition of the bulbar conjunctiva, very prone to become injected from the manipulation or the instillation of any collyrium.

These points, the improbable causes invoked for the coming on of the affection, its course and long duration, its resistance to all treatment, must not be neglected; finally the discovery of ipecac can only confirm the clinical diagnosis.

Procedures to find the ipecac by means of the microscope have been described. They are excellent and the positive results give still more absolute certainty; but they call for special instruments which are not always at hand. furthermore, these practices are not indispensible, the picture of a chemical conjunctivitis (especially from ipecac) is so typical, it differs to such an extent from a conjunctivitis due to a pathogenic microbic agent that with a little acquaintance the indicated elements of diagnosis suffice to identify this affection with certainty.

Can it be confounded with a beginning blennorrhagic conjunctivitis?

If the clinical picture of the very acute beginning now and then leads to its being mistaken for a blennorrhagic conjunctivitis, it will be easy to know whether the patient himself or someone of his family has been infected; it must be remembered that with a blennorrhagic conjunctivitis in an adult the patient, as a rule, has himself a urethritis.

The doubt then can never last but a moment. By the absence of the gonococcus from the conjunctival secretion proven by a bacteriological examination all doubts will be removed.

Furthermore, we must remember the terribly rapid progress of a blenorrhagic conjunctivitis, from which it is considered to be one of the gravest ocular affections, and its complications in the cornea which can hardly be prevented in spite of a careful treatment. All of this will furnish the key to the mystery and set the diagnosis right.

Can it be confounded with granular conjunctivitis?

The symptoms of this affection are so characteristic that a comparison with the symptoms of the chemical conjunctivitis will quickly inform the physician.

In the very rare cases in which some hesitation might subsist after the first inspection of the patient, careful observation and especially the occlusive collodion dressing will remove all doubt, and the disappearance of the provoking agent will take away the source of those primary pesudo-trachomatous follicles which were discovered at the upper margin of the tarsus.

Is it possible to think of diphtheritic conjunctivitis? The pseudomembranous covering which is sometimes found at the beginning of the ipecac conjunctivitis differs completely from the diphtheritic membrane; a series of other symptoms, like its appearance during the course of an eruptive fever, the peculiar œdema of the eyelids, the swelling of the preauricular glands, etc., will very quickly help the diagnosis.

These same considerations apply to streptococcus and Parinaud's conjunctivitis.

Catarrhal conjunctivitis of a more benign type does not hold us for a long time; if a slight doubt should exist in the initial period, a doubt which may be easily removed, the very course of the ipecac conjunctivitis, its peculiar lesions, especially the salmon color of the lower conjunctival fornix, will permit us to identify with certainty this special clinical type.

Sequels of the application of ipecac.—Certain individuals have for a long time used it, for a year or more, in an intermittent fashion every two, three or four days; these applications are not very painful, especially after several repetitions; they keep the eye in such a condition that certain anatomical alterations persist, sufficient that on inspection a disease can be found.

Even in extreme cases the ocular lesions are limited to changes in the conjunctiva; in some cases only in which the dose was

probably very strong we have observed a superficial keratitis which healed without detriment to sight.

The use of ipecac, therefore, seems to be without danger, for in spite of the reaction so violent at first we have not yet encountered a case in which after the suppression of the chemical agent a perfect cure had not resulted.

Treatment.—The treatment is very simple. Above everything else it is necessary to remove the ipecac.

Against the violent symptoms of the beginning, if necessary a cool aseptic compress; if there is a corneal complication a little atropin.

The collodion dressing is a means which has given us the best results in the treatment of this affection as well as in other "provoked" or prolonged diseases in which ipecac was not the cause. We always leave it in place for three or four days; sometimes it must be repeated.

That thus far we have spoken only of the powdered ipecac, a chemical agent, is due to the fact that it was the only one found with our patients. There are, however, other agents which can cause just as strange conjunctival inflammations. We may mention podophylin, jequirity, cantharides, chrysarobin, and others.

We imagine that lesions produced by these chemical bodies must resemble each other very much. The evolution of a provoked disease probably always presents itself in an atypical fashion, altogether different from the complex of symptoms of the disease caused by a pathogenic microbe.

In the beginning of this article we have spoken of the cases of chronic conjunctivitis of a special appearance in which it has not always been possible to identify the provoking agent.

These forms differ from the ipecac type, especially by the anatomic lesions.

Here are some of the symptoms: (1) Predominantly bilateral, much more frequent than in the preceding type; (2) very chronic, torpid behavior, the affection lasting a long time and having resisted all treatment; (3) superficial anatomic alterations of the inferior fornix of the conjunctiva, of a livid tint, the color of red of wine yeast, the vascular network remaining visible but slightly veiled; sometimes similar changes in the conjunctiva of the upper fornix; from time to time pseudo-follicles at the upper tarsal border; (4) in these cases the secretion is more abundant than in the ipecac type but is paradoxical; plentiful at the morning visit, it disappears towards the afternoon when a control visit

and especially an unexpected visit is made; (5) the ætiology given is always most funny, something so far-fetched and uncertain that it is impossible to admit it.

Real causes.—We have observed the use of soap, of tobacco (juice or powder), of pepper, some indiscrete patients have let us conclude that they often used dental tartar (put in in the evening before retiring); finally there are still other means equally queer and not always of the cleanest.

For the diagnosis of these affections the symptoms detailed above are of the greatest value; above all it is the duration and the abnormal course of these affections which will awake our attention.

A single treatment: the occlusive collodion bandage; after one or two applications of this of three or four days each everything is cured.

GLAUCOMA CONSECUTIVE TO THE DISCISSION OF SECONDARY CATARACT.*

By Dr. Menacho,
BARCELONA.

Consecutive or secondary glaucoma is the kind which develops after a pre-existing affection and is in evident relation with it. After this statement I shall occupy myself with a rare complication which may come on after the discission of a secondary cataract.

Among the considerable number of discissions which I have made in my long career, I have been able to control the complications reported by the authors following this intervention, and for myself I must say that I have only a very vague remembrance of the glaucomatous symptoms which I have observed once or twice. They must have been of benign form, for had they been of a grave character I would certainly remember them perfectly.

Yet, I have very recently had occasion to observe at the same time two cases which I think are worth reporting on account of the lessons they furnish; the more so—and my readers will undoubtedly be of the same opinion of all those who want to face

*Archives d'Ophtalmologie, November-December, 1916.

realities—since the complicated cases teach us, I think, more than the simple ones, especially if we can draw useful conclusions from them.

One need, however, not think that this complication is so rare that every single case should be published in order to enrich ophthalmological bibliography. No, only the exceptional cases, as a rule, are published separately, since Bowman as the first in 1865 reported this complication of a discission of a secondary cataract, up to when Dalén, in 1901, published his collective paper. On the whole 37 observations have been published, for we must eliminate from the 94 cases he mentions 40 after combined extraction of cataract and 11 after simple extraction, in order not to overstep the limits of our study. In fact we still should eliminate two more which came on after discissions practiced on primary cataracts.

I will not insist on this latter point by remarking, however, that under the single title of discission of cataract two things are united of very similar appearance and three of a very dissimilar one, discission being practiced under very different conditions. Therefore I do not insist, and limit myself to my subject, the discission of secondary cataract.

The 35 cases collected by Dalén are composed as follows. 8 discissions after a combined extraction and 27 after simple extraction. As regards the time of appearance of the glaucoma, it showed itself in 21 cases in from the first to the 9th day after the discission, in the others the interval was more prolonged.

Among the most recent publications Knapp gives 3 per cent. of consecutive glaucoma after discission of secondary cataract (1 per cent. of light cases which were cured by miotics and 2 per cent. of grave ones which demanded a second iridectomy); that of Gama Pinto gives 1 per cent. to 2 per cent. and that of Kuhnt 1.47 per cent.

These variations in the different statistics are of little significance and we may assume them to be correct. Yet, in order to estimate their value, we would have to know the critical points by which they were guided. Thus for some we have to consider as glaucoma the cases of iritis, serous plastic cyclitis which lead to hypertension; for others, on the contrary, it would be proper to retain only the cases which are free from inflammatory phænomena, but which are characterized by a circum-corneal injection, a corneal trouble, hypertension and which, if they are not attacked at the time, end in producing acute glaucoma and excavation of the papilla.

We can at once affirm that these latter cases are the typical ones, although we need not exclude from the secondary glaucoma those cases preceded by an iritis or cyclitis. We judge that in both cases we have to deal with secondary glaucoma, which we might call *direct* when it appears immediately and *indirect* when it is preceded by inflammatory symptoms of the iris or uvea.

It is evident that the relation between cause and effect is more questionable in the cases I have called direct, for although they show themselves at once after the operation, it is more difficult to understand their occurrence than in those I have called indirect. Still there are some facts which may guide us with certainty in this research, as the result of the treatment employed or the nature of the persistent disease. For instance, (1) if we have an occlusion of the pupil with hypertension which gives way after an iridorrhexis; (2) if a lymphangitis or a serous uveitis with hypertension gives in to miotics; (3) if in an eye with anterior synechiæ glaucomatous symptoms come on which yield to a synechiotomy or a liberal iridectomy; (4) if in a case of traumatic cataract with swelling of the opaque masses hypertension occurs which disappears after the extraction of these masses, we can logically conclude that we have removed the cause; (5) if we see hypertension coming on after a dislocation of the crystalline lens into the anterior chamber, we will attribute it to the same causes since anatomo-pathological researches have plainly shown us the mechanism which provokes them. But we could not establish the same dependence if they came on during the course of an atrophy of the optic nerve or a pigmentary retinitis, because there is no anatomic nor clinical demonstration of their ætiologic relationship.

What will be the demonstration of the causal relation in the cases of secondary glaucoma which I have called direct? I believe that it will suffice to establish the immediate relationship of cause and effect between the discussion and the glaucoma and to show the undoubted action of miotics or of the corresponding surgical intervention in the disappearance of the symptoms of hypertension. This relation has been completely established in many of the published cases and particularly in two cases which I have lately had occasion to observe simultaneously, the description of which I will combine, because they were altogether alike.

Observations.—The two cases concerned gentlemen of regular social position over 60 years of age. They had nuclear cataracts with equatorial striæ, a great deal of transparent cortex, prominent eyes and synchisis of the vitreous body.

In both cases I made a preparatory iridectomy combined with massage (which certainly did not hasten the ripening), one 6 weeks before the extraction; some transparent cortical masses remained behind, became opaque and were absorbed in the following days, in one two weeks later, leaving a thin secondary cataract. As in the other, they were more abundant and therefore the absorption was slower; I made a discission in both.

It is clear that my two cases were very much alike. The only difference was that the first eye, which was the worse of the two, was emmetropic; the second one, with the abundant cortical masses, was myopic with progressive posterior sclerochoroiditis. To make the analogy more complete, the anterior chamber in both cases was deep and I made the discissions three or four weeks after the extraction and with the same rigorous precautions.

I penetrated with the needle of Galezowski at the level of the sclerocorneal limbus following the procedure which in my opinion is the safest from infection. In both cases I instilled atropin before and after the operation, and an hour later I washed the eyes out with an antiseptic lotion and again instilled some atropin. Six hours later the first symptoms of glaucoma showed themselves by the following signs: cornea steamy, anterior chamber cloudy, *tendency to miosis, slight hypertension*, no trace of infection of the wound.

Fearing in the first case, the worse one, the beginning of an infection, I took off the bandage seven hours after the discission and prescribed washing out with cyanide of mercury and inunctions with mercury in lanolin. The next morning, on account of pain and a plus tension, I instilled eserin and ordered it continued until the glaucomatous symptoms should disappear. But a few days (3?) later three hæmorrhages appeared, one in the papillary area and two in the neighboring retina, and since the hypertension became worse at the same time I ordered some cupping, ergot, and later made a subconjunctival sclerotomy which for the moment put an end to the glaucomatous symptoms, leaving V=0.8. All vestige of the hæmorrhagic neuroretinitis disappeared and there was no trace of an excavation of the optic papilla. But on the fifth day the subacute glaucomatous symptoms reappeared and I proposed a further operation, which was accepted after a few days and which consisted of an enlargement of the previous iridectomy.

In the second case at the beginning of the symptoms of hyper-

tension I had eserin instilled several times during an hour and the glaucomatous signs stopped never to return.

Comment.—In the two cases the cataracts were slow in developing and therefore they were operated on in two steps (preparatory iridectomy combined with massage). In both there were transparent masses in considerable numbers and the persistence of some of these gave rise to a slight iritis without incarceration of capsule or iris in the scar and without anterior synechia of the capsule or iris.

I cannot accuse the operative procedure (discission at the level of the corneoscleral limbus) because it has given me satisfaction in multiple cases, and I am so satisfied with it that it seems not possible to operate correctly and without fear of complications when abandoning it.

What then is the cause of the development of the glaucoma? Raehlmann in these cases attributes it to the obliteration of Fontana's spaces by deposits of albumen, principally of globulin, based on the perfectly demonstrated fact that in the normal aqueous humor no traces of albumen appear, until the anterior chamber has been emptied. The newly formed aqueous humor contains albumen, and in the more considerable a quantity the oftener the experiment is repeated. From his studies Raehlmann concludes that the albumen which in serous iritis forms the dots on Descemet's membrane and at the same time clogs the spaces of Fontana. It is this and not the hypersecretion of aqueous humor which is the cause of the glaucoma in iridocyclitis, traumatic cataract and after discissions.

Setting aside the anatomo-pathologic researches, we must confine ourselves to note Raehlmann's assertions and view the question for a moment from the clinical side.

Clinical observation teaches that in the two cases observed by ourselves one, the first, the more serious one, presented the picture of an anterior lymphangitis with increased depth of the anterior chamber which disappeared under the use of miotics and sclerotomy; but an iridectomy was necessary to cure all the glaucomatous symptoms.

In the second case instillations of eserin sufficed to render the tension normal in a definitive and rapid manner. Yet, the clinical observation tells us nothing about the pathogenesis of the disease. For, although I have no doubt that the relation between the discission and the glaucoma is that of cause and effect, which soon follows it like the shadow follows the body, that is immediately, I affirm in a formal manner that these discissions were

made "dry" without any loss of aqueous humor. Therefore, it is impossible to think that the hypertension was due to the obstruction of Fontana's spaces caused by an increased amount of globulin in the endocular lymph and to its rapid reproduction.

It is more logical to suppose that the trauma caused by the discission has provoked in an eye operated upon for cataract a nervous reflex reaction manifesting itself as a desequilibrisation of the circulation of the endocular lymph, which has resulted from this reaction (of the nature of which we are, of course, in ignorance), without stating whether there is a chemical modification in the composition of the lymph or a mechanical obstacle to its evacuation; at any rate there is a lack of equilibrium which manifests itself through the hypertension.

I refuse to believe that in these two cases the cause of the glaucoma was the too early discission. More still, I deny it and base my opinion on the fact that while I was chief of de Wecker's clinic I have seen him make a great many discissions less than two weeks after the cataract extraction (I believe the results are more brilliant than if we wait longer), and I do not remember having seen a single glaucoma coming on in consequence of these operations. I could, also, relate from my practice many facts in support of this hypothesis.

I can, also, disregard as a cause the procedure of discission with the puncture at the corneoscleral limbus since for me this is much safer than when the puncture is made in the cornea.

I think it would be wiser to accuse the use of atropin, which was instilled in both my cases according to usual technic of all operators before the discission in order to see the capsule better and to make it more accessible.

The mydriatic may in predisposed people play a rôle. But, it seems to me, that a very important objection to this hypothesis lies in the fact that for 25 years at least I have always observed the immunity which the aphakic eyes show from glaucoma when there is no incarceration of the iris or capsule in the scar of the operation. And since in my two cases there existed no trace of incarceration I cannot admit an explanation which would annihilate the considerable number of observations which I have made concerning this subject.

Must we incriminate as the cause of the development of glaucoma the sub-iritis, of which my two cases suffered, giving a field poorly prepared for an operation which may have reawakened the activity of the inflammatory germs, which had been incompletely destroyed by the antibodies, and activated their virulence,

thus acting on the contents of albumen in the aqueous humor and finally on the osmosis at the locality of the trabecular tissue of the channels of excretion from the eye?

Let us conclude by affirming in our cases the ætiologic relation between the glaucomatous symptoms and the discission of the secondary cataract. Let us recognize the mists which still enwrap its pathology and let us retain the practical lesson from these complications, that if they remain rebellious under the action of miotics, we must perform an anterior sclerotomy, and even an iridectomy if this is unsuccessful; an ordinary iridectomy on those who have undergone a simple cataract extraction, an amplified iridectomy on those who have been operated on by the combined method.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. F. Hardy, M.D.,

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THE OCULOCARDIAC REFLEX IN SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.

Auer, of Indianapolis (*Jour. A. M. A.*, March 24, 1917), refers to the fact that in the normal individual, pressure on the eyeball causes a slowing of the pulse rate through vagus inhibition. This he used as a basis of study for thirty-seven cases of syphilis of the central nervous system. It has been noted by various observers that a break in the arc such as is caused by tabes would result in an abolition of the oculocardiac reflex. The reflex is sometimes abolished in tabes even though the Argyll Robertson pupil is not present, in which case it might prove of early diagnostic value in determining the condition of the posterior root fibers of the pons and consequently show the degree of ascending extension of the tabetic lesion. Some authors regard the abolition of the oculocardiac reflex as an evidence of the affinity of syphilis for the central nervous system and as constituting one of the first evidences of disease of the central nervous system. Auer records the following observations: (1) Abolition of the oculocardiac reflex is among the earliest signs of syphilitic

disease of the central nervous system and one of easy diagnostic practicability to the general practitioner. (2) The oculocardiac reflex was abolished on the side exhibiting the hemianalgesia with preserved tactile sensation in the case presenting the Millard-Gubler syndrome. (3) In only one case of well marked tabes with cervical involvement in which pressure on the eyeball and tests was not painful, was there evidence of diminished or disturbed superficial sensation other than in the case mentioned above. (4) In 52 per cent. of the cases studied the pulse ranged from 82 to 112, and the increased rate occurred chiefly among the well marked paretics. (5) In third nerve palsy, the ptosis can sometimes be overcome by the patient reinforcing the ptotic lid by forcibly holding the lids of the sound eye closed. (6) During the paroxysms of spasmodic weeping, occurring in pseudobulbar palsy, the radial pulse is practically imperceptible at the wrist, showing a reflex inhibition of the heart beat.

THE EFFECTS OF CINEMATOGRAPH DISPLAY UPON THE EYES OF CHILDREN.

N. Bishop Harmon (*Brit. Med. Jour.*, February 17, 1917) refers to the direct ill-effects on the eyes of children caused by moving pictures and not the indirect effects of late hours, bad air, excitement, etc. The unpleasant effects associated with the cinematograph exhibition, so far as the eyes are concerned, he states, are due to the following conditions: (1) glare; (2) flicker; (3) rapidity of motion; (4) concentration of attention; (5) duration of exhibition. Each point is taken up and discussed. The eye is incapable of adapting itself to a single light in a dark place. Even if feeble the light is relatively intense and therefore irritating. The necessary conditions attending a picture show tend to produce the maximum of fatigue. This is intensified by the programme screen shown between the films. These slides should be such that the contrast between the print and the background is the smallest necessary for visibility. Glare cannot be dissociated from the shows, but can be lessened by sufficient illumination of those parts of the hall removed from the immediate region of the screen. Flicker is irritating and is of two kinds: (1) The effect of the rapid change of the moving film. The effect is irritating according to the slowness of the flicker. The more rapid the change, the less the effect. (2) The flicker due

to bad films, those scratched, patched and worn. With the intent to reduce flicker the films are moved through the machine at a rate greater than the natural rate of progress of events depicted. The resentment to this of the eye is expressed in fatigue. The defect in the film is most evident in "close ups." The cinematograph requires concentration of attention greater than in other entertainment where there is sound as well as sight. This effort is a conscious effort. Picture shows last from one and a half to three hours. For children such a length of time for concentration is unnatural and the nervous effort is increased out of all proportion. Some of these defects in picture exhibits are inherent, some are remediable, and others may be mitigated. The optimum position for observation is in direct line and at a distance equaling three times the height of the screen. If too near all the defects are exaggerated, and the effort to visually cover the field is fatiguing. If too far away concentration is exaggerated, and if to the side the image on the screen is distorted. The evidence as to injury to children's eyes cannot be presented by figures or percentages. It is difficult to say if permanent injury is done. Harman thinks there is an increasing number of children presenting themselves at the clinic who on examination show nothing wrong with their eyes but yet fail to pass the standard visual tests at school. This he thinks might be explained on the basis of fatigue both ocular and mental. If normal eyed children suffer, it is certain that the results will be more serious in those with defective eyes, and possibly lead to permanent aggravation of those defects. The best protection for the child will be secured by the following provisions: (1) The reasonable illumination of all parts of the hall not directly beside the screen. (2) The improvement of the movement of the film so as to reduce flicker and the withdrawal of films immediately they are damaged. (3) An improvement in taking the picture so as to bring the rate of motion of the objects depicted more nearly to the natural. (4) The increase in the number of intervals in the show, and the interposition of exhibitions other than that of the optical lantern. (5) The limitation of shows for children to one hour, and the prohibition of "repeats". (6) The reservation of the children's seats to the "optimum" position in the hall.

With such provisions the indulgence in a show once a week should do no harm to the eyes of a normal child.

RADICAL EXTIRPATION OF THE LACRIMAL SAC.

E. A. Carrasco.—The author's report is based on 110 personal interventions. Siedel's technique—the intraorbital injection in the tract of the nasociliary nerve of 2 ccm. of a 2 per cent. solution of novocain with some drops of adrenalin—produces a complete anæsthesia of the region of the lacrimal sac, which is much superior to that of simple infiltration of the tissues, and suffices in practice for the complete painless extirpation of the sac. To extirpate the lacrimal sac an incision of the teguments suffices, as they are in exact correspondence with the topographical situation of the sac. We are consequently guided by the anatomical situation of the sac and not by that of the angular vessels, because it is indisputable that although there is greater hæmorrhage produced by the section of the angular vessels it is easily controlled by forceps, and instead there is obtained the greater benefit of facilitating the dissection of the upper third of the sac. Also because of the adoption of an infraligamentous incision does not remove the possibility of injury to the vessels at the dissection of the upper third of the sac, which is very frequent in practice.—(Abst. in *Surg., Gyn. and Obst.*, March, 1917, p. 314.)

THE EFFECT OF CONTRASTED ILLUMINATIONS ON THE EYE.

Dr. James Kerr, in a paper read before the Illuminating Engineering Society on February 20th, on the effect on the eye of varying degrees of brightness and contrast, made reference to the conditions prevailing in cinematograph theaters, and several members of the Cinematograph Cimmission took part in the discussion. Dr. Kerr dealt with two kinds of contrast, namely, the simultaneous, caused by glare, and the successive, as in a flicker. Apparently the maximum brightness which the eye was prepared for during its long ages of evolution was the brightest sky. This could generally be taken as 2.5 to 3 candles to the square inch, and some such amount had been suggested as a standard for any visible sources of light. Indirect lighting might accomplish this to perfection; by this method the eye was saved much fatigue, owing to the elimination of violent contrasts; but this comparatively shadowless lighting was not very useful for the examination of small objects and textural surfaces. Both excessive contrast and defective contrast might be equally

troublesome, and even in cases where the surfaces were of moderate brightness and no extreme form of glare would be imagined to exist, an extreme contrast or a contrast operating in the wrong direction might be inconvenient. An instance in point was stage lighting; in some cases the continued fixation of the eye on a brightly lighted stage, with the rest of the field of view in complete darkness, entailed strain. The flickering effect in the case of the cinematograph varied greatly in different halls. The films were progressively circulated from the dearer to the cheaper halls, and by the time they had reached the latter they had deteriorated considerably; this had to be considered very seriously in view of the numbers of children whose eyes and minds and physique were in process of development, attending such displays in poor neighborhoods. The control of the perfection of the film and of the skill of the operator raised very difficult questions, but it ought not to be impossible to arrive at least at a reasonable value for the illumination of the screen in different halls, with a minimum of perhaps one foot candle, and also to ensure a certain control of illumination in the hall itself and to control the switching on and off of the full lighting in such a way as to avoid sudden jerks from light to darkness and the reverse. Sir W. H. Bennett, who was in the chair, said that there was no doubt that since the introduction of cinematograph entertainment there had been a considerable increase of eye trouble among children, and he trusted that the Commission would not overlook the possibility of physical as well as of moral harm.—(*Brit. Med. Journal,* February 24, 1917, p. 271.)

TUBERCULOSIS OF THE CONJUNCTIVA.

Basterra.—The case reported was that of a woman of 43, whose previous history showed neither tuberculosis nor syphilis. In August, 1915, a small pimple appeared in the internal part of the free border of the lower left eyelid, which disappeared and was followed a little later by another with pus. Later developments brought her to the clinic in the November following when an ovaloid tumor was seen in the place involved. The tumor was painless and soft. The rest of the eye was normal. The tumor was extirpated under local anæsthesia followed by cauterization. Recovery was normal and has persisted to the present time. Histological examination of sections of the removed tumor show very palpable evolution of the tubercles.—(Abst. in *Surg., Gyn. and Obst.,* March, 1917, p. 314.)